

## M.Tech. in Mechanical Engineering Specialization: Design Engineering

<b>M.Tech.(Design Engineering) I Semester</b>					
S. No	Course Code	Course Name	L-T-P	Credits	Course Type
<b>Theory Courses</b>					
<b>1</b>	ME 501	Research Methods and Techniques	3-1-0	4	
<b>2</b>	ME 503	Finite Element Methods	3-1-0	4	
<b>3</b>	ME 505	Product Design and Development	3-1-0	4	
<b>4</b>		<b>Department Elective-I</b>	3-1-0	4	
<b>5</b>		<b>Department Elective-II</b>	3-1-0	4	
<b>Practical/Seminar/Dissertation Courses</b>					
<b>6</b>	ME 523	Finite Element Methods Lab	1-0-3	3	
<b>7</b>	ME525	Seminar on Research Topics	0-0-4	2	
<b>8</b>		General Proficiency	-	NC	
<b>Total Credits</b>				<b>25</b>	
<b>Total Contact Hours</b>			<b>16-5-7</b>		

### Open Elective: Course from other schools

<b>M. Tech. (Design Engineering) II Semester</b>					
S. No	Course Code	Course Name	L-T-P	Credits	Course Type
<b>Theory Courses</b>					
<b>1</b>	ME 502	Industrial Tribology	3-1-0	4	
<b>2</b>	ME 504	Experimental Stress Analysis	3-1-0	4	
<b>3</b>		<b>Department Elective-III</b>	3-1-0	4	
<b>4</b>		<b>Department Elective-IV</b>	3-1-0	4	
		<b>Open Elective-I</b>	3-0-0	3	
<b>Practical/Seminar/Dissertation Courses</b>					
<b>6</b>	ME 516	Advance Design Lab	0-0-3	2	
<b>7</b>	ME 518	Preliminary Research Plan	0-0-8	4	
<b>8</b>	GP	General Proficiency	-	NC	
<b>Total Credits</b>				<b>25</b>	
<b>Total Contact Hours</b>			<b>15-4-11</b>		

<b>M. Tech. (Design Engineering) III Semester</b>					
<b>S. No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>	<b>Course Type</b>
<b>1</b>		<b>Open Elective-II</b>	3-0-0	3	
<b>2</b>	ME601	Dissertation I	0-0-34	17	
<b>3</b>	GP	General Proficiency		NC	
		<b>Total Credits</b>		<b>20</b>	
		<b>Total Contact Hours</b>	<b>3-0-34</b>		

**Open Elective: Course from other schools**

<b>M. Tech. (Design Engineering) IV Semester</b>					
<b>S. No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>	<b>Course Type</b>
<b>1</b>	ME 602	Dissertation II	0-0-40	20	
<b>2</b>	GP	General Proficiency	-	NC	
		<b>Total Credits</b>		<b>20</b>	
		<b>Total Contact Hours</b>	0-0-40		

**Total Credits of 2 Year M. Tech. Design is 90.**

<b>M. Tech. (Design Engineering) - Department Elective I</b>					
<b>S. No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>	<b>Course Type</b>
<b>1</b>	ME 507	Advance Mechanical Design	3-1-0	4	
<b>2</b>	ME 509	Advance Mechanics of Solids	3-1-0	4	
<b>3</b>	ME 511	Design of Pressure Vessels and Piping	3-1-0	4	
<b>4</b>	ME 513	Environmental Engineering and Pollution Control	3-1-0	4	

<b>M. Tech. (Design Engineering) - Department Elective II</b>					
<b>S. No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>	<b>Course Type</b>
<b>1</b>	ME 515	Engineering Fracture Mechanics	3-1-0	4	
<b>2</b>	ME 517	Design of Hydraulic and Pneumatic Systems	3-1-0	4	
<b>3</b>	ME 519	Design of Automotive Components	3-1-0	4	
<b>4</b>	ME 521	Design of Material Handling Equipment	3-1-0	4	

<b>M. Tech. (Design Engineering) - Department Elective III</b>					
<b>S. No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>	<b>Course Type</b>
<b>1</b>	ME 506	Vibration Engineering	3-1-0	4	
<b>2</b>	ME 508	Mechanical Behavior of Materials	3-1-0	4	
<b>3</b>	ME 536	Composite Materials and Analysis	3-1-0	4	
<b>4</b>	ME 542	Fundamentals of Mechatronics	3-1-0	4	

<b>M. Tech. (Design Engineering) - Department Elective IV</b>					
<b>S. No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>	<b>Course Type</b>
1	ME 510	Theory of Elasticity	3-1-0	4	
2	ME 512	Theory of Plates and Shells	3-1-0	4	
3	ME 514	Design of Process Equipments	3-1-0	4	
4	ME 544	Machine Tool Design	3-1-0	4	

<b>M. Tech. (Design Engineering) - Open Elective I</b>					
<b>S.No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>	<b>Course Type</b>
1	ES 509	Environment Impact Assessment and Sustainable Development	3-0-0	3	
2	MA 028	Mathematical Modeling with MATLAB	3-0-0	3	
3		Artificial Intelligence	3-0-0	3	
4		Biomedical Instrumentation	3-0-0	3	
5		Microprocessor and Microcontroller	3-0-0	3	

<b>M. Tech. (Design Engineering) - Open Elective II</b>					
<b>S. No</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>	<b>Course Type</b>
1	EN 531	Language Culture and Society	3-0-0	3	
2	MA 004	Optimization Techniques	3-0-0	3	
3	MA012	Computational Mathematics with Python	3-0-0	3	
4	MB 513/ME	Entrepreneurship & New Venture Planning	3-0-0	3	

## M. Tech. in Mechanical Engineering Specialization: Manufacturing Engineering

<b>M. Tech. (Manufacturing Engineering) - I Semester</b>						
S. No.	Course Code	Name of Course	L-T-P	Credits	Course Type	
<b>Theory Courses</b>					<b>UGC</b>	<b>AICTE</b>
<b>1</b>	ME 501	Research Methods and Techniques	3-1-0	4	FC1	PCC
<b>2</b>	ME 503	Finite Element Methods	3-1-0	4	FC2	PCC
<b>3</b>	ME 531	Automation, Machine Vision and Robotics	3-1-0	4	CC1	PCC
<b>4</b>		<b>Department Elective I</b>	3-1-0	4	DSE1	PEC
<b>5</b>		<b>Department Elective II</b>	3-1-0	4	DSE2	PEC
<b>Practical/Seminar/Dissertation Courses</b>						
<b>6</b>	ME 523	Finite Element Analysis Lab	1-0-3	3	FC3	PCC
<b>7</b>	ME 547	Seminar on Research Topics	0-0-4	2	SEC2	PCC
<b>8</b>	GP	General Proficiency	-	NC		
<b>Total</b>				<b>25</b>		
<b>Total Contact Hours</b>			<b>16-5-7</b>			

**Open Elective: Courses from other schools**

<b>M. Tech. (Manufacturing Engineering) - II Semester</b>						
S. No.	Course Code	Name of Course	L-T-P	Credits	Course Type	
<b>Theory Courses</b>					<b>UGC</b>	<b>AICTE</b>
<b>1</b>	ME 532	Metal Cutting and Tool Design	3-1-0	4	CC2	PCC
<b>2</b>	ME 534	Smart Manufacturing and Industry 4.0	3-1-0	4	CC3	PCC
<b>3</b>		<b>Department Elective III</b>	3-1-0	4	DSE3	PEC
<b>4</b>		<b>Department Elective IV</b>	3-1-0	4	DSE4	PEC
<b>5</b>		<b>Open Elective I</b>	3-0-0	3	OE1	OEC
<b>Practical/Seminar/Dissertation Courses</b>						
<b>6</b>	ME 552	Smart Manufacturing Lab	0-0-3	2	CC4	PCC
<b>7</b>	ME 554	Preliminary Research Plan	0-0-8	4	CC5	PCC
<b>8</b>	GP	General Proficiency	-	NC		
<b>Total</b>				<b>25</b>		
<b>Total Contact Hours</b>			<b>15-4-11</b>			

**M. Tech. in Mechanical Engineering**  
**Specialization: Thermal Engineering**

<b>M. Tech. (Thermal Engineering) - I Semester</b>				
<b>S. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>
<b>Theory Courses</b>				
1	ME 501	Research Methods and Techniques	3-1-0	4
2	ME 561	Advanced Heat and Mass Transfer	3-1-0	4
3	ME 563	Advanced Thermodynamics	3-1-0	4
4		<b>Department Elective I</b>	3-1-0	4
5		<b>Department Elective II</b>	3-1-0	4
<b>Practical/Seminar/Dissertation Courses</b>				
6	ME 579	Advanced Thermal Engineering Lab	1-0-3	3
7	ME 581	Seminar on Research Topics	0-0-3	2
8	GP	General Proficiency	-	NC
<b>Total Credits</b>				<b>25</b>
<b>Total Contact Hours</b>			<b>16-5-6</b>	

<b>M. Tech. (Thermal Engineering) - II Semester</b>				
<b>S. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>
<b>Theory Courses</b>				
1	ME 562	Advanced Refrigeration and Air Conditioning	3-1-0	4
2	ME 564	Computational Fluid Dynamics	3-1-0	4
3		<b>Department Elective III</b>	3-1-0	4
4		<b>Department Elective IV</b>	3-1-0	4
5		<b>Open Elective I</b>	3-0-0	3
<b>Practical/Seminar/Dissertation Courses</b>				
6	ME 582	Computational Fluid Dynamics Lab	0-0-3	2
7	ME 584	Prelim Research Plan	0-0-8	4
8	GP	General Proficiency	-	NC
<b>Total Credits</b>				<b>25</b>
<b>Total Contact Hours</b>			<b>15-5-13</b>	

**M. Tech. in Mechanical Engineering**  
**Specialization: Thermal Engineering**

<b>M.Tech (Thermal Engineering) III Semester</b>				
<b>S. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>
<b>Theory Courses</b>				
1		<b>Open Elective II</b>	3-0-0	03
<b>Practical/Seminar/Dissertation Courses</b>				
2	ME 661	Dissertation I	0-0-34	17
3	GP	General Proficiency	-	NC
<b>Total Credits</b>				<b>20</b>
<b>Total Contact Hours</b>			<b>3-0-34</b>	

<b>M.Tech (Thermal Engineering) IV Semester</b>				
<b>S. No.</b>	<b>Course Code</b>	<b>Course Name</b>	<b>L-T-P</b>	<b>Credits</b>
<b>Practical/Seminar/Dissertation Courses</b>				
1	ME 662	Dissertation II	0-0-40	20
2	GP	General Proficiency	-	NC
<b>Total Credits</b>				<b>20</b>
<b>Total Contact Hours</b>			<b>0-0-44</b>	

**Total credits of the programme: 25+25+20+20 = 90**

# M. Tech. in Mechanical Engineering

## Specialization: Thermal Engineering

### **List of Department Specific Electives (DSE)**

#### **Elective-I**

1. ME 503 Finite Element Methods and Analysis
2. ME 565 Measurement and Process Control
3. ME 567 Air Conditioning and Ventilation Systems
4. ME 569 Advanced Fluid Mechanics

#### **Elective-II**

1. ME 571 Advanced I.C Engine and Gas Turbines
2. ME 573 Energy Engineering and Management
3. ME 575 Cryogenic Technology
4. ME 577 Solar energy

#### **Elective-III**

1. ME 566 Experimental Methods in Thermal Engineering
2. ME 568 Alternate Fuels
3. ME 570 Turbo machines
4. ME 572 Advanced and Non-Conventional Energy Systems

#### **Elective-IV**

1. ME 574 Heat Exchanger Analysis and Design
2. ME 576 Aircraft and Rocket Propulsion
3. ME 578 Optimum design of Thermal Systems
4. ME 580 Thermal and Nuclear Power Plants

### **List of Open Electives**

#### **Open Elective-I**

- ES 509 Environment Impact Assessment and Sustainable Development
- MA 028 Mathematical Modelling with MATLAB
- Mechatronics and Robotics
- Artificial Intelligence
- Biomedical Instrumentation
- Microprocessor and Microcontroller

#### **Open Elective-II**

- EN 531 Language Culture and Society
- MA 004 Optimization Techniques
- MA012 Computational Mathematics with Python
- MB 513/ME Entrepreneurship & New Venture Planning

### **Departmental Electives for M.Tech (Thermal Engineering)**

S.No	Course Code	Name of Course	L-T-P	Credits
		<b>Elective-I-DSE1</b>		
1	ME 501	Finite Element Methods and Analysis	3-1-0	4
2	ME 565	Measurement and Process Control	3-1-0	4
3	ME 567	Air Conditioning and Ventilation		4

		Systems		
4	ME 569	Advanced Fluid Mechanics	3-1-0	4
		<b>Elective-II-DSE2</b>		
1	ME 571	Advanced I.C Engine and Gas Turbines	3-1-0	4
2	ME 573	Energy Engineering and Management	3-1-0	4
3	ME 575	Cryogenic Technology	3-1-0	4
4	ME 577	Solar energy	3-1-0	4
		<b>Elective-III-DSE3</b>		
1	ME 566	Experimental Methods in Thermal Engineering	3-1-0	4
2	ME 568	Alternate Fuels	3-1-0	4
3	ME 570	Turbo machines	3-1-0	4
4	ME 572	Advanced and Non-Conventional Energy Systems	3-1-0	4
		<b>Elective-IV-DSE4</b>		
1	ME 574	Heat Exchanger Analysis and Design	3-1-0	4
2	ME 576	Aircraft and Rocket Propulsion	3-1-0	4
3	ME 578	Optimum design of Thermal Systems	3-1-0	4
4	ME 580	Thermal and Nuclear Power Plants	3-1-0	4